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46900 7590 04/30/2009

MENDELSOHN & ASSOCIATES, P.C.
1500 JOHN F. KENNEDY BLVD., SUITE 405
PHILADELPHIA, PA 19102

EXAMINER	
FAULK, DEVONA E	
ART UNIT	PAPER NUMBER
2614	

DATE MAILED: 04/30/2009

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/815,591	04/01/2004	Frank Baumgarte	BAUMGARTE 7-12	1153

TITLE OF INVENTION: LATE REVERBERATION-BASED SYNTHESIS OF AUDITORY SCENES

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	$1510	$300	$0	$1810	07/30/2009

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PTOL-85 (Rev. 08/07) Approved for use through 08/31/2010.

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Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
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INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

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I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/815,591	04/01/2004	Frank Baumgarte	BAUMGARTE 7-12	1153

TITLE OF INVENTION: LATE REVERBERATION-BASED SYNTHESIS OF AUDITORY SCENES

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	$1510	$300	$0	$1810	07/30/2009

EXAMINER	ART UNIT	CLASS-SUBCLASS
FAULK, DEVONA E	2614	381-061000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,

(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 _____

2 _____

3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. The following fee(s) are submitted:

❑ Issue Fee

❑ Publication Fee (No small entity discount permitted)

❑ Advance Order - # of Copies _____

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❑ A check is enclosed.

❑ Payment by credit card. Form PTO-2038 is attached.

❑ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)

❑ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27.

❑ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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2614	

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Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)

(application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 1034 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 1034 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

Notice of Allowability	Application No.	Applicant(s)	
	10/815,591	BAUMGARTE ET AL.	
	Examiner	Art Unit	
	DEVONA E. FAULK	2614	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *amendment filed on 2/27/09*.

2. ☒ The allowed claim(s) is/are *1,3-19,21,24,25,27-33,35-40,43-47,51-61*.

3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 1/6/09 have been fully considered but they are not persuasive.

2. The applicant agreed to an examiner's amendment to place the claims in allowable form.

3. Claims 2,20,22,26,34,41,42,48-50 are cancelled.

Note: Although the applicant had cancelled claim 42, the claim was still recited, as it was written in the previous office action, in the claim listing. Therefore it is included in the examiner's amendment indicated that it should be cancelled.

EXAMINER'S AMENDMENT

4. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Steve Mendelsohn (Reg. No. 35,951) on 2/12/09.

5. The claims are to be amended as follows:

Claims 3,23, and 42: CANCEL.

Claims 4-20, line 1: delete "invention" and insert in its place - - method - - .

Claims 23-33,35-40,42, line 1: delete "invention" and insert in its place - - apparatus - - .

Claims 46-47,52,54,55,57-59, line 1: delete "invention" and insert in its place - - apparatus - - .

Claim 1 is to be amended to recite :

A method for synthesizing an auditory scene comprising: processing at least one input channel to generate two or more processed input signals; filtering the at least one input channel **with a filter or analysis filterbank** to generate two or more diffuse signals; and combining the two or more diffuse signals with the two or more processed input signals to generate a plurality of output channels for the auditory scene, , wherein processing the at least one input channel comprises: converting the at least one input channel from a time domain into a frequency domain to generate a plurality of frequency-domain (FD) input signals; delaying the FD input signals to generate a plurality of delayed FD signals; and scaling the delayed FD signals to generate a plurality of scaled, delayed FD signals, and **wherein: the FD input signals are delayed based on inter-channel time difference (ICTD) data; and the delayed FD signals are scaled based on inter-channel level difference (ICLD) and inter-channel correlation (ICC) data.**

Claim 21 is to be amended as follows:

21. Apparatus for synthesizing an auditory scene, comprising: a configuration of at least one time domain to frequency domain (TD-FD) converter and a plurality of filters, the configuration adapted to generate two or more processed FD input signals and two or more diffuse FD signals from at least one TD input channel; two or more combiners adapted to combine the two or more diffuse FD signals with the two or more processed FD input signals to generate a plurality of synthesized FD signals; and two or more frequency domain to time domain (FD-TD) converters adapted to convert the synthesized FD signals into a plurality of TD output channels for the auditory scene, wherein the configuration comprises: a first TD-FD converter adapted to convert the at least one TD input channel into a plurality of FD input signals; a plurality of delay nodes adapted to delay the FD input signals to generate a plurality of delayed FD signals; and a plurality of multipliers adapted to scale the delayed FD signals to generate a plurality of scaled, delayed FD signals, wherein the apparatus is adapted to generate more than tow output channels from the at least one TD input channel, **and wherein: the delay nodes are adapted to delay the FD input signals based on inter-channel time difference (ICTD) data; and the multipliers are adapted to scale the delayed FD signals based on inter-channel level difference (ICLD) and inter-channel correlation (ICC) data.**

Claim 53 is to be amended as follows:

Apparatus for synthesizing an auditory scene, comprising:

a configuration of at least one time domain to frequency domain (TD-FD) converter and a plurality of filters, the configuration adapted to generate two or more processed FD input signals and two or more diffuse FD signals from at least one TD input channel; two or more combiners adapted to combine the two or more diffuse FD signals with the two or more processed FD input signals to generate a plurality of synthesized FD signals; and two or more frequency domain to time domain (FD-TD) converters adapted to convert the synthesized FD signals into a plurality of TD output channels for the auditory scene, wherein:

the configuration comprises:

a first TD-FD converter adapted to convert the at least one TD input channel into a plurality of FD input signals;

a plurality of delay nodes adapted to delay the FD input signals to generate a plurality of delayed FD signals; and

a plurality of multipliers adapted to scale the delayed FD signals to generate a plurality of scaled, delayed FD signals;

the combiners are adapted to sum, for each output channel, one of the scaled, delayed FD signals and a corresponding one of the diffuse FD signals to generate one of the synthesized FD signals;

each filter is a TD late reverberation filter adapted to generate a different TD diffuse channel from the at least one TD input channel; and

~~the configuration comprises, for each output channel in the auditory scene:~~

~~another TD-FD converter adapted to convert a corresponding TD diffuse channel~~

~~into an FD diffuse signal; and~~
an other multiplier adapted to scale the FD diffuse signal to generate a scaled FD diffuse signal, wherein a corresponding combiner is adapted to combine the scaled FD diffuse signal with a corresponding one of the scaled, delayed FD signals to generate one of the synthesized FD signals **; and**

wherein each other multiplier is adapted to scale the FD diffuse signal based on ICLD and ICC data.

Claim 54 is to be amended as follows:

The invention of claim 53, wherein:

~~each other multiplier is adapted to scale the FD diffuse signal based on ICLD and ICC data;~~
the at least one input channel is at least one combined channel generated by performing BCC coding on an original auditory scene; and the ICLD and ICC data are cue codes derived during the BCC coding of the original auditory scene.

Claim 56 is to be amended as follows:

56.Apparatus for synthesizing an auditory scene, comprising:

a configuration of at least one time domain to frequency domain (TD-FD) converter and a plurality of filters, the configuration adapted to generate two or more processed FD input signals and two or more diffuse FD signals from at least one TD input channel;

two or more combiners adapted to combine the two or more diffuse FD signals with the two or more processed FD input signals to generate a plurality of synthesized FD signals; and two or more frequency domain to time domain (FD-TD) converters adapted

to convert the synthesized FD signals into a plurality of TD output channels for the auditory scene, wherein:

the configuration comprises:

a first TD-FD converter adapted to convert the at least one TD input channel into a plurality of FD input signals;

a plurality of delay nodes adapted to delay the FD input signals to generate a plurality of delayed FD signals; and

a plurality of multipliers adapted to scale the delayed FD signals to generate a plurality of scaled, delayed FD signals;

the combiners are adapted to sum, for each output channel, one of the scaled, delayed FD signals and a corresponding one of the diffuse FD signals to generate one of the synthesized FD signals; each filter is an FD late reverberation filter adapted to generate a different FD diffuse signal from one of the FD input signals; and

the configuration further comprises a further plurality of multipliers adapted to scale the FD diffuse signals to generate a plurality of scaled FD diffuse signals, wherein the combiners are adapted to combine the scaled FD diffuse signals with the scaled, delayed FD signals to generate the synthesized FD signals **; and wherein each other multiplier is adapted to scale the FD diffuse signal based on ICLD and ICC data.**

Claim 58 is to be amended as follows:

The invention of claim 56, wherein:

~~the FD diffuse signals are scaled based on ICLD and ICC data;~~

the at least one input channel is at least one combined channel generated by performing BCC

coding on an original auditory scene; and

the ICLD and ICC data are cue codes derived during the BCC coding of the original auditory

scene.

Claim 60 is to be amended as follows:

60. Apparatus for synthesizing an auditory scene, comprising:

a configuration of at least one time domain to frequency domain (TD-FD) converter and a plurality of filters, the configuration adapted to generate two or more processed FD input signals and two or more diffuse FD signals from at least one TD input channel;

two or more combiners adapted to combine the two or more diffuse FD signals with the two or more processed FD input signals to generate a plurality of synthesized FD signals; and two or more frequency domain to time domain (FD-TD) converters adapted to convert the synthesized FD signals into a plurality of TD output channels for the auditory scene, wherein:

the configuration comprises:

a first TD-FD converter adapted to convert the at least one TD input channel into a plurality of FD input signals;

a plurality of delay nodes adapted to delay the FD input signals to generate a

plurality of delayed FD signals; and

a plurality of multipliers adapted to scale the delayed FD signals to generate a plurality of scaled, delayed FD signals;

the combiners are adapted to sum, for each output channel, one of the scaled, delayed FD signals and a corresponding one of the diffuse FD signals to generate one of the synthesized FD signals;

and the apparatus comprises one filter for every output channel in the auditory scene, **and wherein: the delay nodes are adapted to delay the FD input signals based on inter-channel time difference (ICTD) data; and the multipliers are adapted to scale the delayed FD signals based on inter-channel level difference (ICLD) and inter-channel correlation (ICC) data.**

Claim 61 is to be amended as follows:

61. Apparatus for synthesizing an auditory scene, comprising:

a configuration of at least one time domain to frequency domain (TD-FD) converter and a plurality of filters, the configuration adapted to generate two or more processed FD input signals and two or more diffuse FD signals from at least one TD input channel;

two or more combiners adapted to combine the two or more diffuse FD signals with the two or more processed FD input signals to generate a plurality of synthesized FD signals; and two or more frequency domain to time domain (FD-TD) converters adapted to convert the synthesized FD signals into a plurality of TD output channels for the

auditory scene, wherein: the configuration comprises:

a first TD-FD converter adapted to convert the at least one TD input channel into a plurality of FD input signals;

a plurality of delay nodes adapted to delay the FD input signals to generate a plurality of delayed FD signals; and

a plurality of multipliers adapted to scale the delayed FD signals to generate a plurality of scaled, delayed FD signals;

the combiners are adapted to sum, for each output channel, one of the scaled, delayed FD signals and a corresponding one of the diffuse FD signals to generate one of the synthesized FD signals;

each filter has a random frequency response with a flat spectral envelope, **and wherein: the delay nodes are adapted to delay the FD input signals based on inter-channel time difference (ICTD) data; and the multipliers are adapted to scale the delayed FD signals based on inter-channel level difference (ICLD) and inter-channel correlation (ICC) data.**

Allowable Subject Matter

6. Claims 1,4-19,21,24-25,27-33,35-40,43-47,51-61 are allowed.

7. The following is an examiner's statement of reasons for allowance: Regarding claims 1 21,and 43 prior art Lowe (US 5,371,799).discloses a method of synthesizing an auditory scene, comprising processing at least one input channel to generate two or more processed input signals (Figure 5, input audio sample is fed in through terminal 90 to be processed through azimuth processor 92 and two or more processed input signals

are generated; column 5, lines 49-57);filtering the at least one input channel to generate two or more diffuse signals (range processor 102, filters the input channel and performs processing on the early reflections part of the audio signal to generate two or more diffused signals; Figure 5; column 6, lines 7-14); combining the two or more diffuse signals with the two or more processed input signals to generate a plurality of output channels for the auditory scene (adders 98 and 100, Figure 5), wherein: the method generates more than two output channels from the at least one input channel (Figure 5).Lowe discloses that the method synthesizes a stereo sound auditory scene.

8. Regarding claims 45,51,53,56,60 and 61, prior art Budnikov et al. (US 2005/0069143) discloses a configuration of at least one time domain to frequency domain (TD-FD) converter (FFT , 212, Figure 2) and a plurality of filters (source image processors 216a-216n operate to apply an appropriate one of filters 215a -215n to each of the selected transformed window that has been matched to a reverberation path and that has been assigned for processing by a source image processing kernel; processing is performed in accordance with parameters established by the filter that corresponds to the reverberation path; page 3, ¶ 0028 -¶ 0030), the configuration adapted to generate two or more processed FD input signals and two or more diffuse signals from at least one TD input channel; two or more combiners adapted to combined the two or more diffuse FD signals with the two or more processed FD input signals to generate a plurality of synthesized FD signals (each of the plurality of source image processors 216a-216n reads on combiners, Figure 2; page 3, ¶ 0028 -¶ 0030); and two or more frequency domain to time domain (FD-TD) converters adapted to convert the

synthesized FD signals into a plurality of TD output channels for the auditory scene (IFFT, 217c, 218c; page 4, ¶ 0034- ¶ 0035 discloses that the output is coupled to a loudspeaker system, headphone set or other audio display devices).Budnikov discloses that the method synthesizes a stereo sound auditory scene and that the output can be a loudspeaker system (page 4, ¶ 0035).

Regarding claim 1, the prior art or combination thereof fails to disclose or make obvious the FD input signals are delayed based on inter-channel time difference (ICTD) data; and the delayed FD signals are scaled based on inter-channel level difference (ICLD) and inter-channel correlation (ICC) data..

Regarding claims 43 and 51, the prior art or combination thereof fails to disclose or make obvious the method applies the processing , filtering, and combining for input channel frequencies less than a specified threshold frequency and applies alternative auditory scene analysis processing for input channel frequencies greater than the specified threshold frequency (claim 43) and the apparatus is adapted to generate, combine, and convert for TD input channel frequencies less than a specified threshold frequency and the apparatus is further adapted to apply alternative auditory scene synthesis processing for input channel frequencies greater than the specified threshold frequencies (claim 51).

Regarding claims 21,45,60 and 61, the prior art or combination thereof fails to disclose or make obvious the delay nodes are adapted to delay the FD input signals based on inter-channel time difference data and the multipliers are adapted to scale the delayed FD signals based on inter-channel level difference and inter-channel correlation data.

Regarding claims 53 and 56, the prior art or combination thereof fails to disclose or make obvious the invention as a whole and wherein each other multiplier is adapted to scale the FD diffuse signal based on ICLD and ICC data.

9. Claims 4-19,24,25,27-33,35-40,44,46,47,52,54,55,57-59 are allowed due to dependency on claims 1,21,43,45,51,53,56,60 and 61.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DEVONA E. FAULK whose telephone number is (571)272-7515. The examiner can normally be reached on 8 am - 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian Chin can be reached on 571-272-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Devona E. Faulk/
Examiner, Art Unit 2614